8.3 AVERAGES AND OUTLIERS BETWEEN FRIENDS

Part 1 – Summary Statistics

In this section, you learned a variety of ways to describe and analyze a data set. In this activity, we will explore different measures of center as related to grades in a class.

Suppose two friends are taking the same course but are in two different sections, which hada different number of graded assignments and exams. The friends want to compare their overall grades. The grades of the two students are as follows.

Student A: 78, 89, 95, 64, 98, 0, 87, 84, 76, 93, 89, 77, 61

Student B: 87, 79, 88, 91, 89, 77, 86, 93, 105, 89

1. For each data set, determine the mean, median, mode, range, and standard deviation. Round values to the nearest hundredth, if necessary.

Comparison of Students' Grades		
	Student A	**Student B**
Mean		
Median		
Mode		
Range		
Standard Deviation		

2. Compare the two students' grades. Which value(s) did you use in your comparison? Explain why you picked those values.

3. Determine whether there are any outliers in each student's grades. Remove each outlierfrom the data sets. Explain why each data point you removed is an outlier.

4. For each modified data set, determine the mean, median, mode, range, and standard deviation. Round values to the nearest hundredth, if necessary.

Comparison of Students' Grades with Outliers Removed		
	Student A	**Student B**
Mean		
Median		
Mode		
Range		
Standard Deviation		

5. Do these new values change your mind of which student performed better in the course? Explain why or why not.

6. Do you think outliers should be removed when comparing grades between students? Explain your reasoning.

Part 2 – Empirical Rule

Now we will explore how to calculate probabilities for the class based on the Empirical Rule.

1) Suppose that Test grades have a bell-shaped distribution with a mean of 82 and a standard deviation of 5.

   a) Between which two values do the middle 68% of test grades fall between?

   b) Between which two values do the middle 99.7% of test grades fall between?

   c) Between which two values do the middle 95% of test grades fall between?

2) Based on the same distribution as (1), use the empirical rule to find the following percentages of test grades that are:

   a) Between 77 and 87   b) Between 67 and 97   c) Between 72 and 92

   d) Greater than 87   e) Less than 72

   f) More than 97   h) Less than 67

   f) Less than 87   h) More than 72